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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,861	03/24/2004	Yoon-Ho Kang	8054-42 (LW9080US/KE)	5480
22150	7590	05/16/2005	EXAMINER	
F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			HAMILTON, CYNTHIA	
			ART UNIT	PAPER NUMBER
			1752	
DATE MAILED: 05/16/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/807,861

Applicant(s)

KANG ET AL.

Examiner

Cynthia Hamilton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 24-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 16-18 and 20-22 is/are rejected.
- 7) ☒ Claim(s) 3, 5, 14-15, 19, 23 is/are objected to.
- 8) ☒ Claim(s) 1-35 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. Applicant's election with traverse of Group I in the reply filed on April 25, 2005 is acknowledged. The traversal is on the ground(s) that there is no undue burden placed on the examiner in searching both groups because both groups are classified in class 430. This is not found persuasive because the search for Group I includes searches for polymers and compounds and methods of making compounds. None of this need be considered for the process of Group II. Further, the composition of Group I when considered is not required to be searched in any process subclasses in class 430. The process set forth is not nominal nor is the composition used in the broadest process limited to that of the composition or compound of Group I. Thus, the searches are different. There are 715 patent documents in the composition subclass alone without consideration of the polymer classes and compound classes to be searched for the compound of claim 1. The burden is undue in view of these considerations.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 24-35 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Applicant timely traversed the restriction (election) requirement in the reply filed on April 25, 2005.

3. Claim 5 is objected to because of the following informalities: in line 2, "acetohenone" should be – acetophenone ---. Appropriate correction is required.

4. Claim 3 is objected to because of the following informalities: in line 3, "epichorohydrin" should be – epichlorohydrin ---. Appropriate correction is required.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is no antecedent basis for "the alcohol" in claim 9 or 3 or 1.

7. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The examiner is unsure what is meant by "is used in patterning a color filter in a liquid crystal display" with respect to the resist composition in claim 20. Is this an intended use limitation? Is this a "use" claim? Is this a process claim with no step? Is this a manner in limiting the nature of the resist in that it needs certain properties to be so used? The language leaves unclear what is intended here.

8. Claim 20 provides for the use of the resist composition in patterning a color filter in a liquid crystal display, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 20 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

35 U.S.C. 101 reads as follows:

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Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-2, 11, 18 and 20-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Erdmann (3,295,974). The epoxy resin of Examples 1-6 and 7-15 of Erdmann anticipate the compound of applicants' claims 1-2 and the compositions of Examples 3-7 and 9-14 of Erdmann anticipate the compositions of applicants' claim 11, 18, and 20-21. The curing agents are diazo compounds, diazides, benzoin-methylether, methylene blue or diazide compounds as found in the examples of Erdmann. The Erdmann resins fall within the range of instant n, in col. 1, lines 11-57, wherein Erdman n = instant n – 1 as shown by the formula set forth in col. 1, and the molecular weight set forth by instant claims 2 and 21 with cited weights of 5800, 2200, 3600, 1200, etc. The TABLE of Erdmann discloses 1, 4, 7-8, 10, 12-20, 22-29 to be compounds within the scope of applicants' (4,4'-hydroxy) chalcone reacted with epichlorohydrin to make applicant's compound. Thus, 22 out of 19 examples of dihydroxy chalcone are within the instant applicant's (4,4'-hydroxy) chalcone. With respect to instant claims 20, the compositions of Erdmann are inherently useful in patterning a color filter in a liquid crystal display.

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-3, 8, 10-13, 16-18, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erdmann (3,295,974). The epoxy resin of Examples 1-6 and 7-15 of Erdmann anticipate the compound of applicants' claims 1-2 and the compositions of Examples 3-7 and 9-14 of Erdmann anticipate the compositions of applicants' claim 11, 18, and 20-21. The curing agents are diazo compounds, diazides, benzoin-methylether, methylene blue or diazide compounds as found in the examples of Erdmann. The Erdmann resins fall within the range of instant n, in col. 1, lines 11-57, wherein Erdman n = instant n - 1 as shown by the formula set forth in col. 1, and the molecular weight set forth by instant claims 2 and 21 with cited weights of 5800, 2200, 3600, 1200, etc. The TABLE of Erdmann discloses 1, 4, 7-8, 10, 12-20, 22-29 to be compounds within the scope of applicants' (4,4'-hydroxy) chalcone reacted with epichlorohydrin to make applicant's compound. Thus, 22 out of 29 examples of dihydroxy chalcone are within the instant applicant's (4,4'-hydroxy) chalcone. With respect to instant claims 20, the compositions of Erdmann are inherently useful in patterning a color filter in a liquid crystal display. With respect to the range of instant n, Erdmann makes prima facie obvious the range of instant n from 2-36 as set forth in col. 1, lines 48-55 of Erdmann for use in forming photomechanical printing plates which harden under exposure to light. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 UAPQ2d 1934 (Fed. Cir. 1990). See particularly MPEP 2144.05. With respect to instant claims 12-13 and 21-22, the use of any of the solvents or additives taught by Erdmann to be suitable in his compositions would have been prima facie obvious for forming

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a light-sensitive material for forming a printing plate. In col. 2, lines 31-51, the solvents listed are inclusive of cyclohexanone and the additives are inclusive of dyes which by definition are not pigments but applicants reference pigments in claim 16 as dissolvable thus, applicants do not make a clear distinction in their disclosure between a dye and a pigment with respect to solubility. With respect to instant claim 12, applicants claim the weights of components in "about" language leaving allowance for ranges larger than those claimed. Thus, the teachings of Erdman in col. 2, lines 25-30, with respect to the formulation of his light-sensitive material leave within general range when solvated of the upper limits of the instant formulation wherein up to 10 percent of the weight is epoxy resin and the potential hardening agent within 5 to 50 percent of the epoxy resin before solvation for coating as set forth in col. 4, lines 11-16. With respect to instant claims 2, 8 and 21, the molecular weights of the resins of Erdman fall within the range of 650 to 13,000 as disclosed in col. 7, lines 43-45 which makes obvious the overlapping range of 800 to 20,000 found in applicants' invention. With respect to instant claims 3, 8-10, while Erdman does not specifically disclose how their resins were individually made, in col. 4, he disclosed that the resins are made reacting the unsaturated dihydroxy aromatic ketone, of which 22-29 examples would generate the instant compounds, with epichlorhydrin in the presence of a basic condensation agent such as an alkali metal or an alkaline earth metal hydroxide, i.e. an alkali metal salt, with water and/or an organic solvent such as an aliphatic alcohol to aid in the reaction. In view of ethanol being an aliphatic alcohol cheaply obtained and sodium hydroxide and potassium hydroxide being the commonly used alkaline earth metal hydroxide, the use of either or both in making the epoxy chalcone resins of Erdman would have been prima facie

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obvious in view of Erdman teaching the general procedure for forming his resins by using aliphatic alcohols and alkaline earth metal hydroxides.

13. Claims 1-3 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Panda (Journal of Polymer Science). Under Experimental in Panda the Syntheses of dihydroxy chalcones in the paragraph bridging pages 1757-1758, lower molecular weight compounds and methods of making anticipating the instant processes of claims 3 and 8-10 and compounds of claims 1-2 are found as well as in the second to last paragraph on page 1758. Both NaOH and KOH are used and alcohol is used by Panda. Reference to ethyl alcohol and methanol by Panda on page 1758 is evidence that when using "alcohol" Panda refers to ethyl alcohol. Thus, with respect to instant claims 1-3 and 8-10, the methods and compounds of Panda anticipate as a species the genus of applicants epoxy resin and the processes for making them.

14. Claims 1, 3 and 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Zahir et al (Journal of Applied Polymer Science). The process of forming the trimer and dimer diepoxide on page 1356 of Zahir anticipates the instant process wherein absolute alcohol, i.e. ethanol, is used to make the material in line 2 under Materials thus anticipating the process of claim 9 and wherein  $n=2$  or 3, the compound of instant claim 1 is anticipated by the compounds of Zahir. There is no disclosure to using a curing agent and solvent with the dimer or trimer of Zahir.

15. Claims 1, 3-7, 11, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Choi et al (European Polymer Journal 37). The process of Choi et al shown in Scheme 1 wherein the actual results show  $n$  is at least 1 if not higher anticipates the instant process of claims 3-7 and the final chalcone epoxy made anticipates the instant compound of claim 1. the composition of 3.5 in Choi et al wherein the photoinitiator, i.e. triarylsulfonium



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hexafluoroantimonate, with solvent propylene carbonate is mixed with the chalcone epoxy compound of Choi et al anticipates the instant resist compositions of applicant's claim 11, 18 and 20 wherein the composition is inherently usable in patterning a color filter in a liquid crystal display.

16. Claims 1, 3-7, 11, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Choi et al (Bull. Korean Chem. Soc.). The process of Choi et al shown in Scheme 1 wherein the actual results on page 1208 in the first column just below Scheme 1 wherein  $n = 1.3$  to  $1.5$  thus being instant  $n$  of  $2.3$  to  $2.5$  when considering the Compound I in Scheme 1 of Choi et al which anticipates the instant process of claims 3-7 and the final chalcone epoxy made anticipates the instant compound of claim 1. The composition of Choi et al wherein the photoinitiator, i.e. triarylsulfonium hexafluoroantimonate, with solvent propylene carbonate disclosed at second column on page 1209 at lines 4-6, is mixed with the chalcone epoxy compound of Choi et al with THF, i.e. tetrahydrofuran, as solvent for casting at page 1207, column 2, lower portion of **Characterization** in Choi et al. anticipates the instant resist compositions of applicant's claim 11, 18 and 20 wherein the composition is inherently usable in patterning a color filter in a liquid crystal display.

17. Claim 2, 8 and 21 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Choi et al (Bull. Korean Chem. Soc.).

The process of Choi et al shown in Scheme 1 wherein the actual results on page 1208 in the first column just below Scheme 1 wherein  $n = 1.3$  to  $1.5$  thus being instant  $n$  of  $2.3$  to  $2.5$  when considering the Compound I in Scheme 1 of Choi et al. which anticipates the instant process of claim 3 and the final chalcone epoxy made anticipates the instant compound of claim

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1. The composition of Choi et al wherein the photoinitiator, i.e. triarylsulfonium hexafluoroantimonate, with solvent propylene carbonate disclosed at second column on page 1209 at lines 4-6, is mixed with the chalcone epoxy compound of Choi et al with THF, i.e. tetrahydrofuran, as solvent for casting at page 1207, column 2, lower portion of

**Characterization** in Choi et al. anticipates the instant resist compositions of applicant's claim 11, 18 and 20 wherein the composition is inherently usable in patterning a color filter in a liquid crystal display.

With respect to applicant's claims 2, 8 and 21, if 800 these claims is taken to have one significant figure then the resins of Choi et al as disclosed with  $n=1.5$  at the top of their range set forth having a calculated molecular weight of 795 anticipate the instant resins, processes and compositions because 795 with one significant figure is properly noted as 800 molecular weight and thus applicants range is anticipated by Choi et al at the end point of 800 because a species is disclosed within the range. "A generic claim cannot be allowed to an applicant if the prior art discloses a species falling within the claimed genus." The species in that case will anticipate the genus. *In re Slayter*, 276 F.2d 408, 411, 125 USPQ 345, 347 (CCPA 1960); *In re Gosteli*, 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989).

If 800 in applicant's claim language embraces three significant figures then the following rejection is given by the examiner. With respect to applicant's claims 2, 8 and 21, the molecular weight of Choi et al resins as disclosed with  $n=1.5$  at the top of their range set forth is calculated to be 795. This would make obvious the lower end of the range of "about 800" set forth in instant claims 2, 8 and 21 because "about" allows for a number approximately 800. Thus, the compositions, processes and compound I of Choi et al makes prima facie obvious the

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lower limit of the range set forth in applicant's weight average molecular weight. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Werthheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 UAPQ2d 1934 (Fed. Cir. 1990). See particularly MPEP 2144.05. The term "about" used to define the area of the lower end of a mold as between 25 to about 45% of the mold entrance was held to be clear, but flexible. *Ex parte Eastwood*, 163 USPQ 316 (Bd. App. 1968). Similarly, in *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983). See particularly MPEP 2173.05(b).

Thus, with respect to instant claims 2, 8 and 21, Choi et al either anticipates the instant invention or makes *prima facie* obvious the instant invention depending upon a worker's interpretation of significant figures in the ranges of average molecular weight set forth by applicants. Thus, the issue of anticipation versus *prima facie* obviousness is one of accuracy of applicant's measurements.

The examiner's calculations with respect to molecular weight in Choi et al are as follows:

n=1	Atomic weight	# of atoms	mw	
C		12	39	468
O		16	9	144
H		1	35	35
		total		647

n=1.5	at wt	#	mw	
C		12	48	576
O		16	11	176
H		1	42.5	42.5
		total		794.5

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18. Claims 1-5, 8-11, 18 and 20-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Choi et al (Polymer). With respect to instant claims 1-5, 8-11, 18, and 20-21, the chalcone-based epoxy oligomer made by Choi et al and the process by which it was made and the composition with THF, propylene carbonate and triarylsulfonium hexafluoroantimonate anticipate the instant compound and process of preparing and composition. In Choi et al, see particularly 2.1, 2.2, 3.1 and 3.4, first two paragraphs, 3.7 first paragraph, and Fig. 1.

19. Claims 1 and 3 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Koelbel et al (DE 2256961) as evidenced by AN 82:73919. Koelbel is in German. No translation is now available. AN 82:73919 is an English abstract of Koelbel which makes clear that the epichlorohydrin-dihydroxychalcone oligomers made and methods of making anticipate the instant compounds and processes of applicant's claims 1 and 3 and 10.

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Knovel Critical Tables Row 1734 for Chalcone and Knovel Critical Tables Row 9675 for epichlorohydrin are disclosed to show the host of synonyms known in the art for these compounds used by applicants and make clear the scope of words meant when using especially "chalcone". Hayashi et al (2003/0017351) teach forming chalcone group-containing bisphenol epichlorohydrin type epoxy resins but from viewing the definition of bisphenol at [0019-0026] the bisphenol does not appear to include the dihydroxy chalcone as the bisphenol if "directly" is taken as 4, 4'-dihydroxybisphenol. This type of resin is made in Atkinson (3,410,824 in Example 1 and does not read on the instant formula of applicants. Panda (AN 76:127888 CA) and Panda (AN 81:26365 CA) teach many different dihydroxychalcones reacted with epichlorohydrin. The original Journal articles are not at this time available to the examiner.

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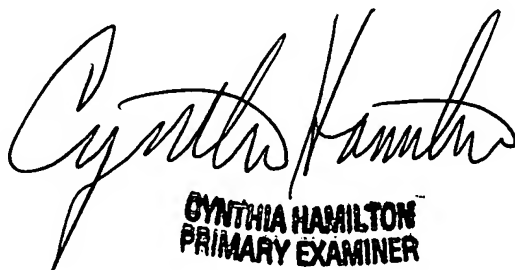
21. Claims 14-15, 19 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Hamilton whose telephone number is 571-272-1331.*

*The examiner can normally be reached on Monday through Friday 9:30 am to 5:00 pm.*

*If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on (571) 272-0729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.*

*Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).*



**CYNTHIA HAMILTON  
PRIMARY EXAMINER**

Cynthia Hamilton  
Primary Examiner  
Art Unit 1752

May 9, 2005